60474100

CONTROL DATA CORPORATION

CDC® 2550-101
EMULATION CONTROLWARE 6671/6676

INSTALLATION HANDBOOK

60474100

CONTROL DATA CORPORATION

CDC® 2550-101
EMULATION CONTROLWARE 6671/6676

INSTALLATION HANDBOOK

REVISION RECORD

REVISION	DESCRIPTION
A	Final Release
12/77	
B	Change made to preface
4/78	

Publication No.
60474100

Address comments concerning this manual to:

Control Data Corporation
Publications and Graphics Division
3519 West Warner Avenue
Santa Ana, CA 92704

or use Comment Sheet in the back of this manual.

Printed in the United States of America

LIST OF EFFECTIVE PAGES

New features, as well as changes, deletions, and additions to information in this manual, are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

PAGE	REV
Cover	-
Title	-
ii thru vi	B
vii	A
1-1	A
2-1 thru 2-13	A
3-1	A
4-1	A
5-1 thru 5-2	A
6-1	A
7-1	A
8-1 thru 8-6	A
A-1	A
Comment Sheet	-
Mailer	-
Back Cover	-

PAGE	REV

PAGE	REV

PAGE	REV

PAGE	REV

PREFACE

This manual describes the procedures used to install the 2550-101 Emulation Controlware in the CDC® Network Processor Unit (NPU). These procedures include loading the emulation controlware programs, configuring the system and initializing the system.

This manual provides sufficient information for a level C customer engineer to configure and initialize the emulation controlware in accordance with the customer's communications line requirements.

For a definition of controlware refer to the CDC Policies and Procedures Manual for Software and Hardware Products, Policy No. 10:14:01.

The related publications listed below are available through the CDC Literature Distribution Services, Minneapolis, Minnesota.

Publication	Publication Number
2550-101 Emulator 6671/6676, Reference Manual	60474000
255X Network Processor Unit Hardware Maintenance Manual	60472000
255X Network Processor Unit Hardware Reference Manual	60472800

The software products described in this document are to be used only as described herein. Control Data cannot be responsible for the proper function of undescribed features or parameters.

CONTENTS

TABLES

APPENDIX

The 2550-101 emulation controlware 6671/6676 is a software program for the 2551-1, -2 and 2552-2 NPUs. The controlware emulates multiple 6671 and/or 6676 data set controllers used with the CYBER 6000 or CYBER 70/170 Series host computers. As many as four data set controllers can be emulated and are referred to in this manual as equipment numbers one through four.

The emulation controlware is supplied as a binary load file on a tape cassette. The initial tape cassette delivered contains the master controlware program at the most current field change order (FCO) revision level. The program tables within the controlware defining equipment and line configurations are empty (nonconfigured). This manual provides the procedures for loading the initial tape cassette, configuring the equipment and lines, and writing a new tape cassette containing the customer's desired equipment and line complement.

PROGRAM TABLES

The configurator initializes or modifies four tables within the controlware. Two of the tables, EQUIP and LINE, are reference tables containing equipment and line specifications relating to the system being emulated. The other two tables, XREF and EQT, are pointer tables facilitating a fast, cross-reference system between the equipment and the lines.

EQUIP TABLE

The EQUIP table provides the following information:

- Type of equipment emulated
- Number of lines assigned to the equipment
- Coupler assigned to the equipment
- Coupler address definitions

LINE TABLE

The LINE table provides the following information:

- Line characteristics (sync/async, switched/dedicated, parity)
- Equipment cross-reference addresses

XREF TABLE

The XREF table is a pointer table ordered by the CLA address and contains pointers to the EQT table that identifies the equipment and line using a particular CLA.

EQT TABLE

The EQT table is ordered by equipment and line number and contains the address of the CLA used for the particular equipment and line.

CONFIGURING

To configure these tables, the configuration accepts a set of parameters entered by the operator through the communications console. In interpreting the parameters supplied by the operator, the configurator functions basically as a character scanner (accepting only the first alphanumeric character or the first few numeric characters of each parameter). The accepted parameter is validated for format and consistency and entered into the appropriate tables. Parameters, other than those appropriate for each step in the configuration process, generate error messages to the operator via the communications console.

Once the configuration parameters have been loaded into main memory via the communications console, the configuration may be captured by writing the tables from memory to tape cassettes. Once the configuration is written onto cassettes, it may be loaded from the cassettes into main memory.

This section describes procedures to load the emulation controlware, configure the system, write the configuration onto cassette tape, and to initialize the system. These procedures are used to initially configure the tables or to change the table parameters.

Once the configuration tables are written to the cassette tape, an abbreviated load procedure is used. See section 3.

LOADING

Load the emulation controlware as follows:

1. Insert the NPU system cassette into the tape transport and close the transport lid. The transport should immediately rewind the cassette if the tape is not fully rewound.

   NOTE

   If a system cassette is already in the transport, it may be necessary to open and close the transport lid (cycling the transport lid switch) to initiate rewind.

2. Observe that the CASSETTE READY indicator illuminates.

3. Set the REMOTE/LOCAL switch on the maintenance panel to the REMOTE position.

4. Press the MASTER CLEAR switch on the maintenance panel.

5. Press the ESCAPE key on the communications console.

6. Press the DEADSTART switch on the maintenance panel.

   NOTE

   The type printout reads 2550-100 SYSTEM 3, which is also applicable to the 2550-101 system.

7. Observe that the system has been succesfully loaded (the message: 2550-100 SYSTEM 03 COPYRIGHT CONTROL DATA CORPORATION 1977 is displayed on the communications console).

   NOTE

   If the system does not load succesfully, display the contents of the A register at the communications console. If this register contains a D, then an error has occurred in loading which causes the bootstrap loader to halt the load by executing a closed loop. In this case, repeat the above sequence of steps, or load another copy of the controlware using the above sequence. If the system still does not load properly, initiate diagnostic procedures in accordance with the hardware maintenance manual (see preface) or notify responsible maintenance personnel.

CONFIGURING

Configuring the emulation controlware is as follows:

NOTE

- Only the underlined characters in an operator input to the console are interpreted by the configurator. For example, if the operator response is: Partial, only the letter P is interpreted as a response. The remaining letters are ignored and the configurator scans for a terminating character. Upper or lower case characters may be used when configuring.

- The symbol < is used to denote the carriage return key on the communications console.

- The operator may abort his response to any query by pressing RUBOUT or DELETE, followed by LINE FEED, and <. After this, the operator may reenter the complete response to the last query.

To activate the configurator, the operator first examines the last communications console display. If the last communications console display consists of a J typed at the beginning of a new line, then

Operator Types: *F<

This activates the configurator, and interactive communications via the communications console with the operator is initiated starting with step 1.

If J does not appear in the last communications console display, the operator initiates the system's manual interrupt processor as follows:

Operator Types:

CTRL BELL (two communications console keys)

System Writes: MI

Operator Types: *F<

The last operator input activates the configurator, and interactive communications via the communications console with the operator is initiated starting with step 1 as described below.

ACTIVATION OF CONFIGURATOR

1. System Writes:

CONFIGURE, RECONFIGURE, OR GO (C,R,G)

Operator Types: Configure<

If the system has never been configured, and the operator responded with Reconfigure or Go, then:

System Writes:

MUST CONFIGURE (CONFIGURE OPTION TAKEN)

and the system proceeds to step 2, as if the operator has responded with Configure.

SPECIFYING EQUIPMENT TYPE

2. System Writes

EQUIPMENT X TYPE (N,1,A)

where X is the logical equipment number. The allowed operator responses are:

Operator Types: None or
1 or
A

where:

1 = 6671 is to be emulated by equipment X

A = 6676 is to be emulated by equipment X

None = logical equipment X will not emulate

If None is the response chosen, the configurator will repeat step 2 for the next logical equipment. If all equipment has been processed, the configurator will proceed to step 5.

After the operator has chosen the equipment option to be emulated:

System Writes: COUPLER NUMBER (1,2)

where the operator is expected to assign logical equipment X to one of the two couplers by:

Operator Types: 1 or
2

LINE ASSIGNMENT (QUANTITY)

3. System Writes:

NUMBER OF LINES=

Operator Types: dd

where dd are the two digits supplied by the operator which represent (in base-10 notation) the number of lines to be assigned to the equipment chosen in step 2.

NOTE

In choosing the number of lines assigned to the equipment chosen, the operator should be aware that:

- If the equipment emulated is a 6671, the number of lines assigned may not exceed 16.
- If the equipment emulated is a 6676, the number of lines assigned may not exceed 64.
- Regardless of the configuration options chosen in step 2, the maximum number of lines assigned for all four logical equipment units may not exceed 128.

To avoid re-entering the configuration process unnecessarily, the operator should configure the system to the maximum number of lines he expected to handle, even though all lines will not be active initially.

LINE SPECIFICATION (TYPE)

4. System Writes

LINE xx

where xx is the line number (starting at 01 and going up to the maximum number of lines specified by the operator in step 3). If this line is to be specified for automatic baud rate detection, then refer to CONFIGURING in section 6 of this manual.

Operator Types:

hh,Switch,Sync,C,I<
Ded

or

hh,Switch,Async,C,I,s,bbbb,FDX<
Ded HDX<
RVHX

or
or

where:

hh = communications line adapter (CLA) address (in hexadecimal notation) assigned to this line. (Maximum of two alphanumeric characters used.)

Switch = a switched line type

Ded = a dedicated line type

Async = an asynchronous line type

Sync = a synchronous line type

C = character length transmitted on this line; C may equal 6, 7 or 8 bits. When operating with ASCII or EBCDIC terminals, C will always equal 8.

I = ignore vertical parity (e.g., no vertical parity is generated or checked). Vertical parity, where required, is normally appended by the host processor. The operator may type Odd (odd parity) or Even (even parity) if it is desired to have the emulator generate or check parity for synchronous lines only.

s = number of stop bits used on an asynchronous line; s may equal 1 or 2.

bbbb = Baud rate at which line transmits, available baud rates are (Note: speeds above 300 baud may require host software modifications):

110	134.5	150	Baud
300	600	1200	Baud
2400	4800	9600	Baud

FDX = full-duplex line (asynchronous only)

HDX = half-duplex line (asynchronous only)

RVHX = Reverse channel half-duplex line (refer to section 7 of this manual for restrictions on use.)

99 = indicates that the line is reserved (line parameters may be defined at a later time using the MODIFY feature.)

NOTE

In choosing the options for each line, the operator should be aware that:

- Synchronous lines are available only to logical equipment units emulating a 6671.
- If emulating a 6676 (as chosen in step 2), only asynchronous lines are available.
- If parity is observed, then the actual character length that is transmitted is C + 1, where the parity bit is supplied by the CLA.
- The stop-bit specification, duplexity specification and baud rate assignment are relevant only on asynchronous line assignments.
- The number of stop bits is contingent upon the baud rate. The configurator does not check for consistency.
- Current SCOPE and NOS operating system restrictions limit the number of line assignments per equipment depending on line speeds. Do not exceed the line and line-speed capabilities of the operating system that the emulator is interfacing.
- For each equipment the lines have to be assigned in a decreasing baud rate order; fastest lines are assigned first, and slowest lines last.

Step 4 is repeated for every line specified in step 3. After all lines have been assigned for a given equipment, the configurator will proceed to the assignment of the next logical equipment by repeating step 2.

After all four logical equipment units have been configured, the configurator proceeds to step 5.

PRINTOUT OF CONFIGURATION

5. System Writes

PRINTOUT (N,P,F)

The allowed operator responses are:

Operator Types: None<

which indicates that no printout is desired, and the configurator proceeds to step 6.

or,

Operator Types: Full<

which indicates that a full printout of the system configuration is required, and the configurator responds with a header:

System Writes:

EQ TYPE CP LINE CLA TYPE USE LEN PAR STOP BAUD DUPLEX

and information regarding all equipment and lines in the system is listed under the header. After the printout, the configurator proceeds to step 6.

or,

Operator Types: Partial<

which indicates that the operator only desires a printout for specific equipment/line combinations.

System Writes: EQUIPMENT=, LINE=

Operator Types: d,xx<

where:

d = equipment number ($1 \leq d \leq 4$)

xx = line number ($1 \leq xx \leq$ maximum specified in step 3 for equipment d)

The configurator first prints a header as for the full printout response, and then lists the information for the equipment/line combination specified. This sequence is repeated until the operator responds to the equipment/line query by:

Operator Types: 0 (zero)<

which indicates that the operator has obtained information for all equipment/line combinations desired and the configurator then proceeds to step 6.

MODIFICATION OF INDIVIDUAL LINE

6. System Writes

MODIFY (N,Y)

The allowed operator responses are:

Operator Types: No<

which indicates that no individual line is to be modified and the configurator proceeds to step 7.

or,

Operator Types: Yes<

which indicates that the operator desires to change the configuration for one or more lines and the configurator responds with:

System Writes: EQUIPMENT=, LINE=

Operator Types: d,xx<

where:

d = equipment number ($1 \leq d \leq 4$)

xx = line number ($1 \leq xx \leq$ maximum specified in step 3 for equipment d)

The configurator responds with a carriage return which indicates that input from the operator is required (formatted as in step 4). This sequence is repeated for various equipment/line combinations until the operator responds to the equipment/line query with:

Operator Types: 0 (zero)<

which indicates that all equipment/line combinations desired have been modified and the configurator reverts to step 5.

TERMINATION

7. System Writes:

GO (N,Y)

If the operator elects to write the configured tables onto cassette tape:

Operator Types: No<

The configurator exits to the operating system dispatcher after displaying:

System Writes:

END OF CONFIGURATION - EXIT TO DISPATCHER

If the operator elects to start running the configured system:

Operator Types: Yes<

System Writes:

END OF SYSTEM CONFIGURATION - INITIALIZE AND GO

END 2550-100 SYSTEM INITIALIZATION

At this point, the system is up and ready.

WRITING

Writing the emulation controlware is as follows:

1. Remove the system cassette from the transport.

2. Insert the UTILITY cassette into the tape transport and close the transport lid. The transport should immediately rewind the cassette if the tape is not fully rewound.

NOTE

If necessary, cycle the transport lid switch (open and close the lid) to initiate rewind.

3. Observe that the CASETTE READY indicator illuminates.

4. Press the MASTER CLEAR switch on the maintenance panel.

5. Press the ESCAPE key on the communications console.

6. Press the DEADSTART switch on the maintenance panel.

7. UTILITY will then be loaded. Note: A bell will ring to indicate when ready. When operating with UTILITY, all characters input from the console must be in upper case.

8. Remove the UTILITY cassette from the transport.

9. Insert a blank cassette in the tape transport, and close the lid. The transport should immediately rewind the cassette, if the tape is not fully rewound.

NOTE

If necessary, cycle the transport lid switch to initiate rewind.

10. Observe that the CASSETTE READY indicator illuminates.

11. Operator Types:

    GSB,0,0,7000,7120,2800/

12. System Writes:

    (three four-digit numbers in hexadecimal notation)

    Example: xxxx yyyy zzzz

13. Ignore the xxxx number.

14. Operator Types:

    WTC,0,yyyy,zzzz/

15. System Responds:

    (BELL)

16. Operator Types:

    WTC,0,0,6000/

    where 6000 is the length of the system minus 1.

17. System Responds:

    (BELL)

18. Operator Types:

    EFC,0,1/

19. System Responds:

    (BELL)

The cassette now contains the configured system parameters. See section 3 for load procedure.

To write system parameters onto additional cassettes, repeat steps 2 through 19 of this procedure.

INITIALIZING

To initialize the emulation controlware, proceed as follows:

1. Operator Types:

   CTRL BELL (two communications console keys)

2. Operator Types:

   *F<

   System Writes:

   CONFIGURE, RECONFIGURE, OR GO (C,R,G)

3. Operator Types: GO<

   System Writes:

   END OF SYSTEM CONFIGURATION -
   INITIALIZE AND GO
   END 2550-100 SYSTEM INITIALIZATION

At this point, the system is up and ready for emulating the data set controllers.

CONFIGURATION EXAMPLE

The example system to be configured consists of:

Equipment 1 - a 6671 with eight lines connected to the host on coupler 1.

Equipment 2 - a 6676 with eight lines connected to the host on coupler 1.

Equipment 3 - a 6676 with three lines connected to the host on coupler 2.

Equipment 4 - not used.

The configurator-operator communications are listed in table 2-1. Each operator response appears on the teletype line subsequent to the system query, with the carriage return and line feed supplied by the system. (Notation used: SW = System Writes, OT = Operator Types, < = Carriage Return Key.)

TABLE 2-1. CONFIGURATION EXAMPLE

Origin	Communications	Comments
OT:	CTRL/BELL (two keys)	If the last communications console display is not "J", then the manual interrupt will have to be activated.
SW:	MI	Manual interrupt activated.
OT:	*F<	Activates the configurator.
SW:	CONFIGURE, RECONFIGURE OR GO (C,R,G)	
OT:	C<	Configure option chosen.
SW:	EQUIPMENT 1 TYPE (N,1,A)	
OT:	1<	Equipment 1 selected for the 6671.
SW:	COUPLER NUMBER (1,2)	
OT:	1<	Equipment 1 assigned to Coupler 1.
SW:	NUMBER OF LINES=	
OT:	8<	Eight lines assigned to Equipment 1.
SW:	LINE 01	
OT:	0,DED,SYNC,8,I<	Line 01 is assigned a synchronous CLA with address 0 on a dedicated line, using 8-bit data; ignore parity.
SW:	LINE 02	
OT:	1,SWITCH,S,8,I<	Line 02 is assigned a synchronous CLA with address 1 on a switched line, using 8-bit data; ignore parity.
SW:	LINE 03	
OT:	99<	Line 03 is skipped and will be unassigned.
SW:	LINE 04	
OT:	6,S,A,8,I,1,12,H<	Line 04 is like 05 except that the line is 1200 baud, half-duplex.
SW:	LINE 05	
OT:	5,S,A,8,I,1,15,F<	Line 05 is assigned an asynchronous CLA with address 5 on a switched, full-duplex line, using 8-bit data and one stop bits at 150 baud.
SW:	LINE 06	

TABLE 2-1. CONFIGURATION EXAMPLE (CONTD)

Origin	Communications	Comments
OT:	4,S,A,7,Ø1,134,F<	Line 06 is assigned an asynchronous CLA with address 4, on a switched line 06 is assigned an asynchronous CLA with address 4, on a switched line at 134.5 baud. This set of parameters will trigger autobaud recognition.
SW:	LINE 07	
OT:	2,D,ASYNC,8,I,2,110,F<	Line 07 is assigned an asynchronous CLA with address 2, on a dedicated, full-duplex line, using 8-bit data and two stop bits at 110 baud.
SW:	LINE 08	
OT:	3,D,ASYNC,8,I,2,110,F<	Line 08 is like 07.
SW:	EQUIPMENT 2 TYPE (N,1,A)	
OT:	A<	Equipment 2 is selected for the 6676.
SW:	COUPLER NUMBER (1,2)	
OT:	1<	Equipment 2 is assigned to Coupler 1.
SW:	NUMBER OF LINES=	
OT:	8<	Eight lines are assigned to Equipment 2.
SW:	LINE 01	
OT:	1F,S,A,8,I,1,300,F<	Line 01 is assigned an asynchronous CLA with address 1F, on a switched, full-duplex line, with 8-bit data and one stop bit at 300 baud.
SW:	LINE 02	
OT:	99<	Leaves line 02 unassigned.
SW:	LINE 03	
OT:	4,D,A,7,Ø1,134,F<	Line 03 is assigned CLA address 4 which has already been assigned.
SW:	CLA IN USE EQUIPMENT 1 LINE 06 REASSIGN (N,Y)	The configurator asks whether the CLA should be reassigned to the new line.
OT:	N<	The operator acknowledges the error and does not wish to reassign, so he types the assignment over which assigns to line 03 an asynchronous CLA with address 1E, on a dedicated line, with 7-bit data and one stop bit at 134.5 baud.
OT:	1E,D,A,7,Ø1,134,F<	

TABLE 2-1. CONFIGURATION EXAMPLE (CONTD)

Origin	Communications	Comments
SW:	LINE 04	
OT:	1C,SW,ASY,8,I,2,110,F<	Line 04 is assigned an asynchronous CLA with address 1C, on a switched, full-duplex line, with 8-bit data and two stop bits at 110 baud.
SW:	LINE 05	
OT:	1D,S,A,8,I,2,110,F<	Line 05 is like 04.
SW:	LINE 06	
OT:	99<	Leaves line 06 unassigned.
SW:	LINE 07	
OT:	20,S,A,8,I,2,110,F<	Line 07 is assigned an asynchronous CLA with address 20, on a switched, full-duplex line, using 8-bit data and two stop bits at 110 baud.
SW:	LINE 08	
OT:	21,S,A,8,I,2,110,F<	Line 08 is assigned an asynchronous CLA with address 21, on a switched, full-duplex line, using 8-bit data and two stop bits at 110 baud.
SW:	EQUIPMENT 3 TYPE (N,1,A)	
OT:	A<	Equipment 3 is selected for the 6676.
SW:	COUPLER NUMBER (1,2)	
OT:	2<	Equipment 3 is assigned to Coupler 2.
SW:	NUMBER OF LINES=	
OT:	3<	Three lines are assigned to Equipment 3.
SW:	LINE 01	
OT:	2F,S,A,8,I,1,300,F<	Line 01 is assigned an asynchronous CLA with address 2F, on a switched, full-duplex line with 8-bit data and one stop bit at 300 baud.
SW:	LINE 02	
OT:	2E,S,A,7,Ø1,134,F<	Line 02 is assigned an asynchronous CLA with address 2E, on a switched line 02 is assigned an asynchronous CLA with address 2E, on a switched line at 134.5 baud. This set of parameters will trigger auto-baud recognition.

TABLE 2-1. CONFIGURATION EXAMPLE (CONTD)

Origin	Communications	Comments
SW:	LINE 03	
OT:	2D,D,A,8,I,2,110,F<	Line 03 is assigned an asynchronous CLA with address 2D, on a dedicated, full-duplex line with 8-bit data and two stop bits at 110 baud.
SW:	EQUIPMENT 4 TYPE (N,1,A)	
OT:	N<	Equipment 4 is designated to remain unassigned.
SW:	PRINTOUT (N,P,F)	
OT:	F<	Full printout is desired.
SW:		Tabulated data shown in table 2-2.
SW:	MODIFY (N,Y)	
OT:	Y<	Operator chooses to modify.
SW:	EQUIPMENT=, LINE=	
OT:	1,3<	Equipment 1, line 3 is to be modified to become a synchronous, dedicated line with CLA address 7, with 8-bit data and no parity.
OT:	07,DED,SYN,8,IGN<	
SW:	EQUIPMENT=, LINE=	
OT:	0<	Termination of the modification process.
SW:	PRINTOUT (N,P,F)	
OT:	PARTIAL<	Partial printout chosen.
SW:	EQ TYPE CP LINE CLA TYPE USE LEN PAR STOP BAUD DUPLEX	
SW:	EQUIPMENT=, LINE=	
OT:	1,3<	Operator wants to see Equipment 1 Line 3 printout only.
SW:	1 1 1 03 07 DED SYNC 8 IGN	
SW:	EQUIPMENT=, LINE=	
OT:	0<	Termination of partial printout.
SW:	MODIFY (N,Y)	

TABLE 2-1. CONFIGURATION EXAMPLE (CONTD)

Origin	Communications	Comments
OT:	N<	No further modification.
SW:	GO (N,Y)	
OT:	N<	The 2550-10X controlware is not to be started immediately.
SW:	End of Configuration - Exit to Dispatcher	Exit to dispatcher.

TABLE 2-2. FULL PRINTOUT FOR CONFIGURATION EXAMPLE

EQ	TYPE	CP	LINE	CLA	TYPE	USE	LEN	PAR	STOP	BAUD	DUPLEX
1	1	1	01	00	DED	SYNC	8	IGN			
1	1	1	02	01	SWICH	SYNC	8	IGN			
1	1	1	03	UND							
1	1	1	04	06	SWICH	ASYN	8	IGN	1	1200	HALF
1	1	1	05	05	SWICH	ASYN	8	IGN	1	150	FULL
1	1	1	06	04	SWICH	ASYN	7	ODD	1	134.5	FULL
1	1	1	07	02	DED	ASYN	8	IGN	2	110	FULL
1	1	1	08	03	DED	ASYN	8	IGN	2	110	FULL
2	A	1	01	1F	SWICH	ASYN	8	IGN	1	300	FULL
2	A	1	02	UND							
2	A	1	03	1E	DED	ASYN	7	ODD	1	134.5	FULL
2	A	1	04	1C	SWICH	ASYN	8	IGN	2	110	FULL
2	A	1	05	1D	SWICH	ASYN	8	IGN	2	110	FULL
2	A	1	06	UND							
2	A	1	07	20	SWICH	ASYN	8	IGN	2	110	FULL
2	A	1	08	21	SWICH	ASYN	8	IGN	2	110	FULL
3	A	2	01	2F	SWICH	ASYN	8	IGN	1	300	FULL
3	A	2	02	2E	SWICH	ASYN	7	ODD	1	134.5	FULL
3	A	2	03	2D	DED	ASYN	8	IGN	2	110	FULL

RECONFIGURATION

Reconfiguration allows for changing line parameters. In choosing whether to configure or reconfigure the system, the operator should be aware that the equipment types emulated in the system and the number of lines assigned to an equipment can only be changed by choosing the configure option. If the configure option is chosen, then the entire system has to be configured.

RECONFIGURATION EXAMPLE

The following procedure illustrates reconfiguration entry via the communications console. The configured system of the configuration example is used as a baseline for this example. The following reconfiguration data is added:

1. Equipment 1, line 3, is undefined.
2. Equipment 3, line 3, is changed to a switched line.

The configurator-operator communications are listed in table 2-3. Each operator response appears on the same communications console line as the system query with no carriage return or line feed in between. (Notation used: SW = System Writes, OT = Operator Types, < = Carriage Return Key.)

ERROR MESSAGES

ERROR IN FIELD X

Cause:

1. a missing field
2. an incorrect alphabetic option character used
3. in a decimal option field, a decimal value out-of-range or a nondecimal character used
4. in a hexadecimal option field, a hexadecimal value out-of-range or a non-hexadecimal character used
5. a required option is missing when the field never appeared
6. the input line may be over 40 characters in length, preventing some fields from being seen

Corrective Action:

After the error message is printed, the entire input line is retyped with the erroneous field corrected.

Typical Errors:

1. a CLA address not in the range of 0 to 7F
2. an equipment number not in the range of 1 to 4
3. a line number not in the range of 1 to 16 (or maximum specified) for a 6671, or 1 to 64 (or maximum specified) for 6676
4. the number of lines specified is greater than the number that the particular equipment can accommodate
5. the total number of parameters for a CLA is insufficient (the synchronous CLA has five options, and the asynchronous CLA has eight options)

CLA IN USE EQUIPMENT X LINE YY

Cause:

Specified CLA has already been assigned previously to the noted equipment and line combination.

Corrective Action:

The configurator prints REASSIGN (N,Y). If the operator responds with NO< then he may retype the input line correcting the CLA address. If the operator responds with YES< then the latest CLA assignment will be implemented and the previous assignment nulled.

MUST CONFIGURE (CONFIGURE OPTION TAKEN)

Cause:

The RECONFIGURE or GO response was given to the CONFIGURE, RECONFIGURE, OR GO (C,R,G) message when the system was not configured.

Corrective Action:

By default, the configurator proceeds as if the operator responded with CONFIGURE. No further action other than going through the configuration procedure is required of the operator.

ERROR IN READ-RETYPE

Cause:

The operator response or parameter was not successfully transmitted by the communications console.

Corrective Action:

Retype the entire input line.

TABLE 2-3. RECONFIGURATION EXAMPLE

Origin	Communications	Comments
OT:	CTRL/BELL (two keys)	If the last communications console display is not "J" then the manual interrupt will have to be activated.
SW:	MI	Manual interrupt activated.
OT:	*F<	Configurator activated.
SW:	CONFIGURE, RECONFIGURE OR GO (C,R,G)	
OT:	R<	Reconfiguration is chosen.
SW:	PRINTOUT (N,Y)	
OT:	N<	No printout is desired.
SW:	MODIFY (N,Y)	
OT:	Y<	Modification is desired.
SW:	EQUIPMENT=, LINE=	
OT:	1,3<	Equipment 1, line 3 to be modified.
OT:	99<	This line is to be cancelled.
SW:	EQUIPMENT=, LINE=	
OT:	3,3<	Equipment 3, line 3 to be modified.
OT:	2D,S,A,8,I,2,110,F<	This line is changed from a dedicated to a switched line.
SW:	PRINTOUT (N,Y)	
OT:	N<	No printout is desired, yet.
SW:	MODIFY (N,Y)	
OT:	N<	No further modification.

CLA IN USE EQUIPMENT X
LINE YY REASSIGN (Y,N)

Cause:

The CLA reference has already been assigned.

Corrective Action:

If the operator intended that the current assignment be accepted, he will respond with Y<; the old assignment is to be nulled (disregarded). A N< response indicates that the operator acknowledges an error in the CLA address assignment and the old assignment is not changed.

CLA XX_{16} – DATA SET NOT READY

Cause:

The data set ready signal was OFF on a dedicated line for the specified CLA during initialization.

Corrective Action:

The operator should check hardware connections and try again by initiating the *F manual interrupt. At this point the configurator is activated and the operator responds to the Step 1 query with GO.

COUPLER Y CANNOT BE INITIALIZED –
ABORT, RETRY, OR CONTINUE (A,R,C)

Cause:

(Y equals 1 or 2 as specified in the configuration procedure). This message indicates that the specified coupler could not be accessed successfully by the initializer.

Corrective Action:

The operator should check the hardware prior to responding. A response of A< indicates that the initialization process is to be aborted. A response of R< indicates that the initialization process is to be retried for the indicated coupler. A response of C< (to be used only on systems configured for two couplers) directs the controlware to service the equipment defined for the operational coupler, and to ignore the equipment defined for coupler Y.

NOTE

If a C response is used, the controlware must be reloaded to reactivate the servicing of the associated coupler Y.

DUPLICATE CLA XX DETECTED

Cause:

This message (XX is the CLA address in hexadecimal notation) indicates that, in the process of initialization, two or more CLAs were found to have the same address assigned.

Corrective Action:

The operator must correct the duplication and initialize the CLA.

PE

Cause:

A memory parity error was detected.

Corrective Action:

Call the local customer engineer.

IP

Cause:

An invalid parameter was detected by the manual interrupt processor.

Corrective Action:

Select only the allowable manual interrupt function (*C, *D, *F, *G, *I, *u).

MUX ERROR

Cause:

The controlware has detected a multiplex loop interface adapter malfunction. (This error causes the system to hang).

Corrective Action:

The operator should report the error to the site CE. Then the controlware should be reloaded and initialized.

This section describes procedures to load and initialize the controlware with a cassette tape which contains the desired configuration tables. To initially configure the tables or to change table parameters, refer to section 2.

LOADING

Perform tape loading as follows:

1. Insert the configured system cassette tape into the transport and close the transport lid. The transport should immediately rewind the cassette if the tape is not fully rewound.

   NOTE

   If a configured system cassette is already in the transport, it may be necessary to open and close the transport lid (cycling the transport lid switch) to initiate rewind.

2. Observe that the CASSETTE READY indicator illuminates.

3. Set the REMOTE/LOCAL switch on the maintenance panel to the REMOTE position.

4. Press the MASTER CLEAR switch on the maintenance panel.

5. Press the ESCAPE key on the communications console.

6. Press the DEADSTART switch on the maintenance panel.

   NOTE

   The tape printout reads 2550-100 SYSTEM 3, which is also applicable to the 2550-101 system.

7. Observe that the system has been successfully loaded (the message: "2550-100 SYSTEM 03 COPYRIGHT CONTROL DATA CORPORATION 1977" will be displayed on the communications console).

   NOTE

   If system does not load successfully, display contents of A Register at communications console. If A contains a D then an error occurred in loading which caused bootstrap loader to halt the load by executing a closed log. In this case, repeat above sequence of steps or load another copy of controlware using above sequence. If system still does not come up, initiate diagnostic procedures in accordance with hardware maintenance manual (see preface) or notify responsible maintenance personnel.

INITIALIZING

Perform initializing procedure as follows:

1. Operator Types:

   CTRL BELL (two communications console keys)

   System Writes: MI

2. Operator Types: *F<

   System Writes:

   CONFIGURE, RECONFIGURE, OR GO (C,R,G)

3. Operator Types: GO<

   System Writes:

   END OF SYSTEM CONFIGURATION - INITIALIZE AND GO

   END 2550-100 SYSTEM INITIALIZATION

At this point the system is up and ready for emulating the data-set controllers.

ERROR MESSAGES

Refer to section 2 for Error Messages.

This section describes the procedure for temporary application of controlware changes by installing field change orders (FCOs). Application of FCOs provides a method to patch the controlware until a corrected version can be shipped to the customer site on cassette tape.

NOTE

The actual printout from the tape is 2550-100 SYSTEM 03 and is applicable to the 2550-101.

FCOs must be installed immediately after the 2550-101 SYSTEM 03 COPYRIGHT CONTROL DATA CORPORATION 1977 message is displayed on the communications console after loading. Upper or lower case characters may be used. < denotes the Carriage Return key.

CAUTION

After the controlware is initialized:

1. The *I manual interrupt must not be activated.

2. The *D manual interrupt must not be used to dump more than 20 (hexadecimal) words of memory per command.

PROCEDURE

Perform FCO installation as follows:

1. Load system or configured cassette. See section 2 or 3, loading instructions.

2. System Writes:

   2550-100 SYSTEM 03

   COPYRIGHT CONTROL DATA CORPORATION 1977

3. Operator Types: Control "C"

   System Writes: MI

4. Operator Types:

   *I, start,$hhhh_1$,$hhhh_2$,$hhhh_3$,$hhhh_4$, $hhhh_5$<

   where: start is the hexadecimal core address

   $hhhh_i$ is the hexadecimal value to be entered ($hhhh_1$ through $hhhh_5$ are contiguous memory addresses)

   System Writes: J

   The above action changes the contents of the specified address to the new value ($hhhh_i$).

5. Operator Types:

   *D, start,end<

   where: start is the starting hexadecimal core address

   end is the ending hexadecimal core address

   This action displays the new contents of the specified address.

6. Proceed to configure the system. See section 2, for instructions on configuring.

NOTE

The operator may abort his response to any query by pressing RUBOUT or DELETE, followed by LINE FEED, and <. After this, the operator may reenter the complete response to the last query.

DEACTIVATE/REACTIVATE A CLA

To deactivate or reactivate a synchronous or asynchronous CLA from service proceed as follows:

NOTE

- Only a configured CLA can be affected by this routine. Thus the initial condition of the CLA is active.
- Note that once a CLA is deactivated by the *U routine, there are only two way to reactivate it.

  By reloading the -100 controlware cassette.

  By using the *U routine to reactivate the CLA.
- Once a CLA is deactivated then neither reconfiguring nor reinitializing can reactivate the CLA to service.
- The *U routine can be entered at any time after configuration.
- Only the underlined characters in an operator input to the console are interpreted by this routine. For example, if the operator response is Partial, only the letter P is interpreted as a response. The remaining letters are ignored and the routine scans for a terminating character. Upper or lower case characters may be used.
- The symbol < is used to denote the carriage return key on the communications console.
- The operator may abort his response to any query by pressing RUBOUT or DELETE, followed by LINE FEED, and <. After this, the operator may reenter the complete response to the last query.
- To start the deactivate/reactivate routine, the operator first examines the last communications console display. If the last communications console display consists of a "J" typed at the beginning of a new line, then,

  Operator Types: *U<

  This starts the deactivate/reactivate routine, and interactivate communications via the communications console with the operator is initiated starting with step 1.
- If J does not appear in the last communications console display, the operator initiates the system's manual interrupt processor as follows:

  Operator Types:

  CTRL BELL (two communications console keys)

  System Writes: MI

  Operator Types: *U<
- The last operator input activates the deactivate/reactivate routine, and interactive communications via the communications console with the operator is initiated starting with step 1.

DEACTIVATE/REACTIVATE PROCEDURE

System Writes:

Deactivate or reactivate CLA from service (D, R).

NOTE

To reactivate a CLA from service - proceed to step 2.

To deactivate a CLA from service - continue step 1.

1. Deactivate

Operator Types: Deactivate<

System Writes:

Affected CLA address = (0 -7F).

Operator Types: XX

Where XX is the affected CLA number within the range (0 -7F).

If XX is within the valid range and has been previously defined, then

System Writes:

CLA Address XX is now deactivated.

Where deactivation process is completed and system exits to the dispatcher, or

System Writes:

CLA address XX not defined - request aborted.

Where deactivation process is not executed, and system returns to dispatcher.

2. Reactivate Procedure

Operator Writes:

Affected CLA address - (0 -7F)

Operator Types: XX

Where XX is the affected CLA number within the range (0 -7F).

If XX is within the valid range and has been previously defined, then

System Writes:

CLA address XX is now reactivated

Where reactivation process is completed and system exits to the dispatcher, or

System Writes:

CLA address XX not defined - request aborted.

Where reactivation process is not executed, and system returns to dispatcher.

This section describes the procedures and restrictions involved in using autobaud (automatic baud rate detection).

RESTRICTIONS

- Autobaud is implemented on a per line basis.
- To utilize autobaud on a line, that line must physically be a switched asynchronous line.
- Autobaud detection is restricted to the following baud rates.

110	134.5	150 Baud
300	600	1200 Baud

- Autobaud must be requested during configuration or reconfiguration.
- Autobaud requires timely action from the terminal operator corresponding with dial in. Again, action is required on a per line basis.

INITIAL CONFIGURATION

To initially configure a line so as to implement autobaud, proceed as follows:

NOTE

System OPERATOR must have proceeded as directed by section 2 under configuring to step: Line Specification (type).

1. Operator Types:

   hh, S, A, 7, 1, 13, F

   Where:

   hh = Communications line adapter (CLA) address (in hexadecimal notation) assigned to this line. (Maximum of two alphanumeric characters used.)

2. Autobaud is now implemented for line hh.

   NOTE

   Configuration of a switched, asynchronous, 134.5 baud line results in the same operator entry as in Step 1. The line is processed by autobaud and requires corresponding operator action.

3. Repeat step 4 of section 2 unless all lines have been assigned for a given equipment.

   If all lines have been assigned for a given equipment then repeat step 2 of section 2.

   If all four logical equipment units have been configured, then go to step 5 of section 2.

OPERATOR ACTIONS

If a line has been configured to trigger automatic baud rate detection then the terminal operator must perform one of two sets of timely actions corresponding with each dial in of a terminal, as follows.

1. Action set for all terminals except the the IBM 2741 terminal:

   Within one minute of dial-in of an autobaud configured terminal, the terminal operator must send a series of carriage returns (maximum of ten). These carriage returns are required by the controlware to trigger stepping through a baud table during autobaud recognition.

2. Action set for the IBM 2741 terminal only:

   To trigger autobaud recognition it is not necessary to send any carriage returns from the 2741 terminal, either before or after dial in. The standard operating procedures for the 2741 terminal automatically initiates autobaud recognition and terminal action then continues normally. If proper action set is not performed or connection is not made within the time limit then redial in and repeat the proper action set.

The support of 1200 baud half-duplex modems with secondary carrier and secondary request-to-send signals for terminal turnaround control is subject to the restrictions described in the following paragraphs.

HOST SOFTWARE REQUIREMENTS

- Reverse channel HALF-DUPLEX (RVHX) is not supported by standard TELEX. Modifications are required for RVHX support. (Modifications can be obtained from the Systems Division through the Special-Products Library.)
- If operating under standard host software the RVHX feature has no effect and the entire system operates normally as if the feature did not exist.

HARDWARE REQUIREMENTS

- CLA cables requires wiring through:

  Pin 12 - Providing SDCD

  Pin 17 - Providing SRTS

  In addition to the standard signals of RD, SD, RTS, CTS, DCD, DSR and DTR.
- Option change in the CLA is required. Set strapping options to 2 and 5. Refer to asynchronous CLA maintenance manual (see preface).
- RVHX channels require use of the Bell 2025 modem with reverse channel implemented.

TERMINALS SUPPORTED

- Data speed 40
- Datapoint
- PAC 1200

EMULATOR/MODEM INTERCONNECT

Any reverse channel half-duplex terminal/modem connected to the emulator is supported, if it follows the certain I/O to terminal constraints.

OUTPUT TO TERMINAL

Outputting data to the reverse channel terminals occurs when primary carrier drops, secondary carrier comes up, and clear to send comes up. A delay of 0 to 200 milliseconds where secondary carrier drops and comes back up is considered a line hit, and no action is taken. A delay of 200 to 1000 milliseconds where secondary carrier drops and comes back up is considered a break, and a break character is forwarded to the host. If the secondary carrier does not come up after one second, the assumption of the terminal's status is dead and therefore the emulator disconnects the terminal.

INPUT FROM TERMINAL

None

Two distinct sets of contiguous error counters reside within the software which may be dumped at the local NPU console for observation by the analyst or customer engineer, as follows:

- One set of global error counters (eleven words) record errors detected on a global basis independent of CLA or line number distinction.
- One set of line table error counters (five words) for each configured line. These error counters are referenced by the associated CLA number, and are useful as indicators of the type and quantity of errors being experienced on any given line. See appendix for line table format.

GLOBAL ERROR COUNTERS — DISPLAY PROCEDURE

To display the set of global counters onto the communications console proceed as follows:

NOTE

The symbol < is used to denote the carriage return key on the communications console.

1. After the controlware is initialized:

   The *I manual interrupt must not be activated.

   The *D manual interrupt described below must not be used to dump more than 20 words of memory per command. Failure to observe this restriction could result in controlware failure, and need to reload and reinitialize.

   The use of the *D manual interrupt will tend to degrade system quality and should be used sparingly.

   The operator may abort his response to any query by pressing RUBOUT or DELETE, followed by LINE FEED, and <. After this, the operator may reenter the complete response to the last query.

2. The operator should examine the last communications console display. If the last communications console display consists of a J typed at the beginning of a new line, then:

   Operator Types: *D,0070,007A<

   This results in the displaying of the global set of error counters onto the communications console. When the full set of eleven words has been displayed then:

   Operator Types: *C<

   This releases the manual interrupt routine and continues standard processing.

3. If the J does not appear in the last communications console display, the operator initiates the system manual interrupt processor as follows:

   Operator Types:

   CTRL BELL (two communications console keys)

   System Writes: MI

   Operator Types: *D,0070,007A<

   This results in the displaying of the global set of error counters to the communications console. When the full set of eleven words has been displayed, then:

   Operator Types: *C<

   This releases the manual interrupt routine and continues standard processing.

LINE TABLE ERROR COUNTERS — DISPLAY PROCEDURE

To display the line table set of error counters onto the communications console proceed as follows:

NOTE

The symbol < is used to denote the carriage return key on the communications console.

1. After the controlware is initialized:

   The *I manual interrupt must not be activated.

   The *D manual interrupt described below must not be used to dump more than 20 words of memory per command. Failure to observe this restriction could result in controlware failure, and need to reload and reinitialize.

The use of the *D manual interrupt tends to degrade system quality, and should be used sparingly.

The operator may abort his response to any query by pressing RUBOUT or DELETE, followed by LINE FEED, and <. After this, the operator may reenter the complete response to the last query.

2. The operator should examine the last communications console display. If the last communications console display consists of a J typed at the beginning of a new line, then:

   Operator Types: *D,aaaa,bbbb

   Where:

   aaaa,bbbb = The entry from table 8-1 which is cross referenced by the CLA number (XY). Where XY is the number of the CLA whose set of error counters is to be displayed.

   This results in the set of line table error counters (five words) associated with CLA number (XY) being displayed onto the communications console.

   If another set of error counters is to be displayed immediately then repeat Step I, else:

   Operator Types: *C<

   This releases the manual interrupt routine and continues standard processing.

3. If the J does not appear in the last communications console display, the operator initiates the systems manual interrupt processor by:

   Operator Types:

   CTRL BELL (Two communications console keys)

   System Writes: MI

   Operator Types: *D,aaaa,bbbb<

   Where:

   aaaa,bbbb = The entry from table 8-1 which is cross referenced by the CLA number (XY). Where XY is the number of the CLA whose set of error counters is to be displayed.

   This results in the set of line table error counters (five words) associated with CLA number (XY) being displayed onto the communications console.

   If another set of error counters is to be displayed immediately then repeat Step I, else:

   Operator Types: *C<

This releases the manual interrupt routine and continues standard processing.

DISPLAY INTERPRETATION — GLOBAL ERROR COUNTERS

The set of global error counters will be displayed as in table 8-2.

Where:

0070 = the core address of the first counter displayed.

pppp = the 1st counter displayed. Location 0070 - count of CLA addresses equal to or greater than 128_{10}, detected during input.

qqqq = the 2nd counter displayed. Location 0071 - count of CLA addresses equal to or greater than 128_{10}, detected during output.

rrrr = the 3rd counter displayed. Location 0072 - count of illegal line frames.

ssss = the 4th counter displayed. Location 0074 - Not currently used.

tttt = the 5th counter displayed. Location 0074 - count of MLIA input buffer full.

uuuu = the 6th counter displayed. Location 0075 - count of MLIA output loop errors detected by a macro routine during MLIA status interrupt.

vvvv = the 7th counter displayed. Location 0076 - count of MLIA input loop errors detected by a macro routine during MLIA status interrupt.

wwww = the 8th counter displayed. Location 0077 - count of output loop errors. This global counter is incremented whenever any line table output loop error counter (3rd word displayed for a set of line table error counters) is incremented.

xxxx = the 9th counter displayed. Location 0078 - count of input loop errors. This global counter is incremented whenever any line table input loop error counter (4th word displayed for a line table) is incremented.

yyyy = the 10th counter displayed. Location 0079 - count of internal rejects from coupler number 1. Detected on a read from or write to the coupler.

007A = the core address of the next counter to be displayed.

zzzz = the 11th counter displayed. Location 007A - count of internal rejects from coupler number 2. Detected on a read from or write to the coupler.

NOTE

Global error counters are reset to zero and activated on loading controlware. Initialization does not reset the global error counters. They should be displayed once to obtain a reference count, and then displayed at a later point to determine the relative count over a known time base.

DISPLAY INTERPRETATION — LINE TABLE ERROR COUNTERS

A set of line table error counters will be displayed as in Table 8-3.

Where:

aaaa = the core address of the first counter displayed.

vvvv = the 1st counter displayed. Line Table word 24_{10} - count of unsolicited input detected by the input data processor.

wwww = the 2nd counter displayed. Line table word 25_{10} - count of unsolicited output detected by the output data processor.

xxxx = the 3rd counter displayed. Line table word 26_{10} - count of output loop errors detected while processing status.

yyyy = the 4th counter displayed. Line table word 27_{10} - count of input loop errors detected while processing status.

zzzz = the 5th counter displayed. Line table word 28_{10} - count of internal rejects from coupler assigned to this CLA (check configuration). Detected on a read from or write to the coupler.

NOTE

All sets of line table error counters are reset to zero and activated on loading controlware and again on initialization. A set should be displayed once to obtain a reference count, and then displayed at a later point to determine the relative count over a known time base.

TABLE 8-1. LINE TABLE ERROR COUNTERS - CROSS REFERENCE CLA NUMBER "XY" TO "START,END" DISPLAY LOCATION

Y \ X	0	1	2	3	4	5	6	7
0	0528,052C	0548,054C	0568,056C	0588,058C	05A8,05AC	05C8,05CC	05E8,05EC	0608,060C
1	0728,072C	0748,074C	0768,076C	0788,078C	07A8,07AC	07C8,07CC	07E8,07EC	0808,080C
2	0928,092C	0948,094C	0968,096C	0988,098C	09A8,09AC	09C8,09CC	09E8,09EC	0A08,0A0C
3	0828,082C	0848,0B4C	0B68,086C	0888,088C	08A8,0BAC	08C8,08CC	0BE8,0BEC	0C08,0C0C
4	CD28,0D2C	0D48,0D4C	0D68,0D6C	0D88,0D8C	0DA8,0DAC	ODC8,0DCC	0DE8,0DEC	0E08,0E0C
5	OF28,0F2C	0F48,0F4C	0F68,0F6C	0F88,0F8C	OFA8,0FAC	0FC8,0FCC	OFE8,0FEC	1008,100C
6	1128,112C	1148,114C	1168,116C	1188,118C	11A8,11AC	11C8,11CC	11E8,11EC	1208,120C
7	1328,132C	1348,134C	1368,136C	1388,138C	13A8,13AC	13C8,13CC	13E8,13EC	1408,140C

Y \ X	8	9	A	B	C	D	E	F
0	0628,062C	0648,064C	0668,066C	0688,068C	06A8,06AC	06C8,060C	06E8,06EC	0708,070C
1	0828,082C	0848,084C	0868,086C	0888,088C	08A8,08AC	08C8,08CC	08E8,08EC	0908,090C
2	0A28,0A2C	0A48,0A4C	0A68,0A6C	0A88,0A8C	0AA8,0AAC	08C8,0ACC	0AE8,0AEC	0B08,0B0C
3	0C28,0C2C	0C48,0C4C	0C68,0C6C	0C88,0C8C	0CA8,0CAC	0CC8,0CCC	0CE8,0CEC	0D08,0D0C
4	0E28,0E2C	0E48,0E4C	0E68,0E6C	0E88,0E8C	0EA8,0EAC	0EC8,0ECC	0EE8,0EEC	0F08,0F0C
5	1028,102C	1048,104C	1068,106C	1088,108C	10A8,10AC	10C8,10CC	10E8,10EC	1108,110C
6	1228,122C	1248,124C	1268,126C	1288,128C	12A8,12AC	12C8,12CC	12E8,12EC	1308,130C
7	1428,142C	1448,144C	1468,146C	1488,148C	14A8,14AC	14C8,14CC	14E8,14EC	1508,150C

TABLE 8-2. DISPLAY OF THE SET OF GLOBAL ERROR COUNTERS

```
System Writes:

0070      pppp   qqqq   rrrr   ssss   tttt   uuuu   vvvv   wwww   xxxx   yyyy
007A      zzzz
```

TABLE 8-3. DISPLAY OF A SET OF LINE TABLE ERROR COUNTERS

```
System Writes:

aaaa      vvvv   wwww   xxxx   yyyy   zzzz
```

TRACE OPTION

The trace option is provided to store dump information which is used to analyze line problems. The trace includes data received from the host, data transmitted from the host, and data transmitted to the communication line for the specified line(s). See table 8-4.

TABLE 8-4. TRACE OPTION PROCEDURE

User Entry	System Response
Control Bell	MI
*G C R	STOP OR BEGIN TRACE (S,B), ONE OR ALL LINES (O, A)
B, A C R (traces all defined active lines) OR B, O C R (traces a specific line)	TRACE REQUEST HAS BEEN SUCCESSFULLY COMPLETED, and system exits MI state; trace activated. CLA ADDRESS FOR TRACE REQUEST = (0-7F).
CLA number C R	(Valid) TRACE REQUEST HAS BEEN SUCCESSFULLY COMPLETED and system exits MI state; trace activated. (Invalid) CLA REQUEST XX NOT DEFINED - TRACE REQUEST ABORTED, and system exits MI state; trace not activated.
To de-activate the trace: Control Bell	 MI
*G C R	STOP OR BEGIN TRACE (S, B), ONE OR ALL LINES (O, A)
S, A C R (stops all tracing) OR S, O C R (stop tracing on specific line)	TRACE REQUEST HAS BEEN SUCCESSFULLY COMPLETED, system exits MI state; trace de-activated. CLA ADDRESS FOR TRACE REQUEST = (0-7F)
CLA number C R	(Valid) TRACE REQUEST HAS BEEN SUCCESSFULLY COMPLETED, and system exits MI state; trace de-activated. (Invalid) CLA ADDRESS XX NOT DEFINED - TRACE REQUEST ABORTED, and system exits MI state; trace not de-activated.

APPENDIX A

LINE TABLE FORMAT

Word	Software 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 / Firmware 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
0	LINE CONTROL INFORMATION
1	CLA ADDRESS
2	COUPLER OUTPUT BUFFER ADDRESS
3	COUPLER INPUT BUFFER ADDRESS
4	MPC INPUT
5	MPC OUTPUT
6	LINE CONTROL STATUS
7	NOT USED
8	COMMAND WORD 2
9	COMMAND WORD 3
10	PAD INFO (SYNC) CMD WD4 (ASYNC)
11	COUPLER EQUIP STATUS WORD ADDRESS
12	FUNCTION CODE MASK
13	CLA STATUS WORD 1
14	AUTO BAUD STATE
15	COMMAND WORD 1
16	HOLDING OUTPUT BUFFER
17	HOLDING INPUT BUFFER
18	REVERSE CHANNEL - HDX FLAG - BIT 15
19	CLOCK CELL
20	OUTPUT STATE COUNTER
21	DISCONNECT (FUNCTION CODE 6000 ASYNC)
22	TURN CARRIER AROUND FCN – 2000 ASYNC
23	NOT USED
24	UNSOLICITED IDP COUNTER
25	UNSOLICITED ODD COUNTER
26	OUTPUT LOOP ERROR COUNTER
27	INPUT LOOP ERROR COUNTER
28	COUPLER INTERNAL REJECT COUNTER
29	NOT USED
30	NOT USED
31	NOT USED

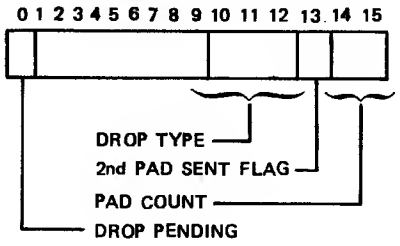
*All Auto Baud Lines to be configured as:
ASYNC, SWITCHED, 134.5 Baud FDX

WORD 0 – LINE CONTROL INFORMATION

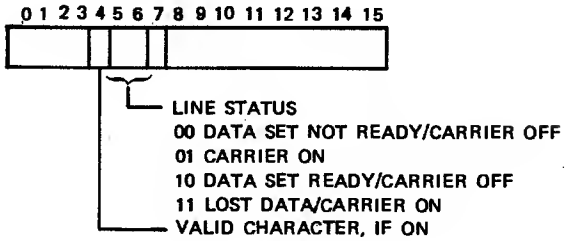
Firmware

0 – ASYNC – AUTO BAUD LINE WHEN SET
0 – SYNC – LINE SYNC'D ON INPUT WHEN SET
1 – ASYNC – WAITING FOR CR WHEN SET
1 – SYNC – SEARCH FOR SYNC WHEN SET
2 – ODD OUTSTANDING (ASYNC)
3 – LINE NOT DEFINED IF SET
4 – TRACE LINE WHEN SET
5 – ASYNC ONLY – TIMER RUNNING
6 – DEACTIVATE/REACTIVATE LINE---I/O
7 – REVERSE CHANNEL READY IF SET
8 – 6676 IF SET
9 – LINE TYPE SWITCHED IF SET
10 – ACCUMULATE OUTPUT
11 – ACCUMULATE INPUT
12 – NEXT OUTPUT IS MPC
13 – NEXT INPUT IS MPC
14 – LINE MODE HDX IF SET
15 – LINE TYPE – SYNC IF SET

WORD 10 PAD INFORMATION



WORD 6 IOCW



COMMENT SHEET

MANUAL TITLE 2550-101 Emulation Controlware 6671/6676 Installation Handbook

PUBLICATION NO. 60474100 REVISION B

FROM: NAME: _____

BUSINESS ADDRESS: _____

COMMENTS:

This form is not intended to be used as an order blank. Your evaluation of this manual will be welcomed by Control Data Corporation. Any errors, suggested additions or deletions, or general comments may be made below. Please include page number references and fill in publication revision level as shown by the last entry on the Record of Revision page at the front of the manual. Customer engineers are urged to use the TAR.

CUT ALONG LINE

AA3419 REV. 11/69 PRINTED IN U.S.A.

NO POSTAGE STAMP NECESSARY IF MAILED IN U. S. A.

FOLD ON DOTTED LINES AND STAPLE

STAPLE

STAPLE

FOLD

FOLD

FIRST CLASS
PERMIT NO. 8241

MINNEAPOLIS, MINN.

BUSINESS REPLY MAIL
NO POSTAGE STAMP NECESSARY IF MAILED IN U.S.A.

POSTAGE WILL BE PAID BY

CONTROL DATA CORPORATION
Publications and Graphics Division
3519 West Warner Avenue
Santa Ana, California 92704

CUT ALONG LINE

FOLD

FOLD

CORPORATE HEADQUARTERS, P.O. BOX 0, MINNEAPOLIS, MINN. 55440
SALES OFFICES AND SERVICE CENTERS IN MAJOR CITIES THROUGHOUT THE WORLD

LITHO IN U.S.A.

CONTROL DATA CORPORATION